IN THE CLAIMS

1-6. (Cancelled).

7. (Currently Amended) An imaging system ~~for forming an image,~~ characterized at least by an ambiguity function and a point spread function (PSF), which ambiguity function is a function of a normalized spatial frequency parameter u and a vertical variable v related to a misfocus parameter ψ, and which PSF is at least a function of the misfocus parameter ψ, the imaging system comprising:

at least one lens and an optical mask that cooperate to image light from an object to form an optical image ~~that is limited in frequency content by an aperture of the lens or of the optical mask~~, which light is characterized by at least phase; and

a detector for detecting the optical image over a range of spatial frequencies to generate a stored image,

wherein the optical mask is configured for modifying ~~wavefront~~ the phase of the light such that a main lobe of the ambiguity function is broader in v for a given value of u and the PSF has a functionally different form for a given value of ψ, in comparison to a main lobe of an ambiguity function and a PSF, respectively, characterizing the imaging system without the optical mask for those given values of u and ψ, ~~there are no zeros in an optical transfer function of the system over detected spatial frequencies of the optical image~~ over an extended depth of focus larger than a depth of focus formed without the optical mask.

8. (Currently Amended) The system of claim 7, further comprising ~~a detector for detecting the optical image and~~ a post-processor for processing the ~~detected optical~~ stored image, in accordance with the PSF, to ~~reverse~~ remove imaging ~~blurring~~ effects induced by the optical mask and to form an electronic image that is clearer over the extended depth of focus as compared to an electronic image formed by the system and without the optical mask and over the extended depth of focus.

9-10. (Cancelled).

11. (Currently Amended) An imaging system having insensitivity to misfocus, the imaging system being characterized at least by an ambiguity function and a point spread function (PSF), which ambiguity function is a function of a normalized spatial frequency parameter u and a misfocus parameter ψ, and which PSF is also a function of at least the misfocus parameter ψ, the imaging system comprising:

at least one lens, an optical mask and a detector that cooperate to image light from an object to form a ~~detected optical~~ stored image, which lens is characterized by at least a length L, a focal length f, a front principal plane and a rear principal plane, and which light is characterized by at least phase and a wavelength λ, the optical mask modifying ~~wavefront~~ the phase such that a main lobe of the ambiguity function is broader for a given range of ψ at a given value of u, and the PSF has a functionally different form, in comparison to a main lobe of an ambiguity function and a PSF, respectively, characterizing the imaging system without the optical mask for that given range of the misfocus parameter ~~there are no zeros in an optical transfer function of the system within detected spatial frequencies of the detected optical image over a range of~~ ψ, defined by the equation:

$$\psi = \frac{L^2}{4\pi\lambda}\left(\frac{1}{f} - \frac{1}{d_o} - \frac{1}{d_i}\right),$$

where d_o is a distance from the object to the front principal plane and d_i is a distance from the rear principal plane to the detector ~~Ψ from -pi/10 to pi/10~~.

12. (New) The imaging system of claim 11, wherein the range of the misfocus parameter is a range defined as $-\frac{\pi}{10} \le \psi \le \frac{\pi}{10}$.

13. (New) The imaging system of claim 11, wherein the optical mask is formed integrally with the lens.

14. (New) A method for imaging, in an optical system characterized by at least an ambiguity function and a point spread function (PSF), which ambiguity function is a function of a normalized spatial frequency parameter u and a vertical variable v related to a misfocus

parameter ψ, and which PSF is at least a function of the misfocus parameter ψ, the method comprising:

imaging light from an object to form an optical image, which light is characterized by at least phase; and

detecting the optical image to generate a stored image,

wherein imaging includes modifying the phase, such that a main lobe of the ambiguity function is broader in v for a given value of u, and the PSF has a functionally different form for a given value of ψ over an extended depth of focus that is larger than a depth of focus formed without modifying the phase, in comparison to a main lobe of an ambiguity function and a PSF, respectively, characterizing the optical system without modifying the phase for those given values of u and ψ.

15. (New) The method of claim 14, further comprising:

post-processing the stored image to remove imaging effects induced in the image by modifying the phase, to form an electronic image that is clearer over the extended depth of focus as compared to an electronic image formed by the imaging system without modifying the phase.

16. (New) An imaging system, comprising:

a lens and an optical mask that cooperate to image light from an object to form an optical image having a range of spatial frequencies that is limited by an aperture of at least one of the lens and the optical mask, which light includes at least phase; and

a detector for detecting the optical image over the range of spatial frequencies to generate a stored image,

wherein the imaging system is characterized at least by an ambiguity function and a point spread function (PSF), which ambiguity function is a function of a normalized spatial frequency parameter u and a vertical variable v related to a misfocus parameter ψ, and which PSF is at least a function the misfocus parameter ψ, and

wherein the optical mask is configured for modifying the phase without reducing the range of spatial frequencies, such that a main lobe of the ambiguity function is broader in v for a given value of u and the PSF has a functionally different form

for a given value of ψ, in comparison to a main lobe of an ambiguity function and a PSF, respectively, characterizing the imaging system without the optical mask for those given values u and ψ, over an extended depth of focus larger than a depth of focus without the optical mask.

17. (New) The imaging system of claim 16, further comprising

a post-processing arrangement for processing the stored image to remove imaging effects induced by the optical mask, to form an electronic image that is clearer over the extended depth of focus as compared to an electronic image that would be formed by the imaging system without the optical mask and over the extended depth of focus.

18. (New) A method for imaging light from an object to form an image in an optical system, which light includes phase and which imaging system is characterized at least by an ambiguity function and a point spread function (PSF), which ambiguity function is a function of a normalized spatial frequency parameter u and a vertical variable v related to a misfocus parameter ψ, and which PSF is at least a function of the misfocus parameter ψ, the method comprising:

forming the image; and

detecting the image over a range of spatial frequencies,

wherein forming the image includes modifying the phase without reducing the range of spatial frequencies, such that a main lobe of the ambiguity function is broader in v for a given value of u and the PSF has a functionally different form for a given value of ψ, in comparison to a main lobe of an ambiguity function and a PSF, respectively, characterizing the imaging system without modifying the phase for those given values u and ψ, over a range of object distances between the object and the imaging system.

19. (New) The method of claim 18, further comprising:

post-processing the image to remove imaging effects induced in the image by the modifying, to render an electronic image that is clearer over the range of object distances, as compared to an electronic image that would be formed by the imaging system if the step of forming did not include modifying phase.

20. (New) An imaging system characterized at least by an ambiguity function and a point spread function (PSF), which ambiguity function is a function of a normalized spatial frequency parameter u and a misfocus parameter ψ, and which PSF is also a function of at least the misfocus parameter ψ, the imaging system comprising:

a lens and an optical mask that cooperate to image light from an object to form an optical image, which light is characterized by at least phase; and

a detector for detecting the optical image over a range of spatial frequencies to form a detected image,

wherein the optical mask is configured for modifying the phase such that a main lobe of the ambiguity function is broader for a given range of ψ at a given value of u and the PSF of the system has a functionally different form, in comparison to a main lobe of an ambiguity function and a PSF, respectively, characterizing the imaging system without the optical mask for that given range of the misfocus parameter ψ and over a range of object distances from the object to the system.

21. (New) The system of claim 20, further comprising a post-processor for processing the detected image, to remove imaging effects induced in the optical image by the optical mask and to form an electronic image that is clearer, as compared to an electronic image that would be formed by the system without the optical mask, over the range of object distances.

22. (New) The system of claim 20, wherein the optical mask is configured to implement a cubic phase modulation.

23. (New) The system of claim 20 wherein the optical mask is formed integrally with the lens.